

RECEIVED
CENTRAL FAX CENTER

OCT 11 2006

PATENT APPLN. NO. 10/519,073
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

IN THE DRAWINGS:

Please replace the figure of the present application with the attached replacement sheet of drawings.

Attachment: Replacement Drawing Sheet

E:\10-06\mmm-056-ptc-resp-111-vke1.wpd

RECEIVED
CENTRAL FAX CENTER

OCT 11 2006

PATENT APPLN. NO. 10/519,073
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

REMARKS

For convenience in discussing applicants' response to the Action, the headings used in the Action are used below.

Drawings

A replacement drawing sheet is attached. The label "Fig. 1" has been removed in the replacement drawing sheet. Removal of the objection to the drawing is believed to be in order and is respectfully requested.

Specification

The specification has been amended as noted below to remove the informalities noted by the Office and to correct minor errors noted by the applicants.

First, in the paragraph beginning on page 30, line 16, "the other" has been deleted. Applicants believe that the amendment makes clear that in Experiment 4, a 8.6 wt.% N-methylpyrrolidone solution containing 18.2 parts by weight of thermoplastic polyimide (binder α 2) or a 8.6 wt.% N-methylpyrrolidone solution containing 18.2 parts by weight of thermoplastic polyimide (binder α 3) was used to construct batteries A9 and A10.

Second, the experimental portion of the specification has been amended to clarify the procedures of the experiments. The

amendments are believed to resolve the confusion resulting from the references to Experiment 1.

The Office also notes in the objections to the specification that it is not clear how binders $\alpha 1$ and $\beta 1$ differ from each other. These binders necessarily differ from each other in that different polyamic acids are used as starting materials resulting in different polyimides obtained in the binders. Applicants believe that a person of ordinary skill in the art would understand that the use of different polyamic acids is required to obtain binders having different properties if the same conditions are used.

Applicants note that the term "polyamide" has been corrected to --polyimide-- in the paragraphs beginning on page 19, line 11, and page 30, line 9.

Removal of the objections to the specification is believed to be in order and is respectfully requested.

Double Patenting

Claims 2-8, 11, 13-15, 17, 20-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting ("ODP") as being unpatentable over claims 1-4, 6-9, 12, 19, 21, 24, 41, and 75-77 of copending Application No. 10/363,039. Claims 2-8, 11, 13-15, 17, 20-22 are provisionally rejected on the ground of nonstatutory ODP as being unpatentable over claims 1-4, 6-9, 12,

PATENT APPLN. NO. 10/519,073
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

19, 21, 24, 41, and 75-77 of copending Application No. 10/673,348. Claims 2-8, 11, 13-15, 17, 20-22 are provisionally rejected under the judicially created doctrine of ODP as being unpatentable over claims 1-15 of copending Application No. 11/001,192.

Without admitting the propriety of the ODP rejections, applicants respectfully request that the provisional ODP rejections over copending application Serial Nos. 10/363,039; 10/519,073; and 11/001,192 be held in abeyance pending the determination of allowable subject matter in the present application or one of the copending applications.

Claims Analysis

The Office states that the recitation "the current collector is subjected to heat treatment before the active material layer is provided on the surface of the current collector" has not been given patentable weight since it is a process limitation. However, heat treatment of a metallic foil can cause structural changes detectable by chemical analysis. (Refer, for example, to the description in the specification on page 5, lines 10-12). For example, in the case of a rolled metallic foil, the organization structure is changed by a heat treatment, which can be observed by microscopic observation of the cross section of the foil. MPEP 2113 provides:

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting that terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.)

Therefore, since heat treatment imparts distinctive structural characteristics to the current collector, the structure implied by the recitation "the current collector is subjected to heat treatment before the active material layer is provided on the surface of the current collector" should be considered when assessing the patentability of the claims.

Claim Rejections - 35 USC § 102/103

Claims 2-8, 11, 13-15, 17, 20-22 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nobufumi (JP 2000-012088) (hereinafter: "Nobufumi"). Claims 2-8, 11, 13-15, 17, 20-22 are also rejected under 35 U.S.C. 102(e) as being unpatentable over Fukui (US 2004/0043294) (hereinafter: "Fukui").

Initially, applicants note that Fukui is not an effective reference against the claims of the present application because Fukui is not prior art as of its international filing date under 35 U.S.C. 102(e). The publication of the international application of which Fukui is the U.S. national stage, publication WO 02/21616 A1, is in Japanese. Therefore, the international application has no effects under 35 U.S.C. § 102(e). Notwithstanding that Fukui is not an effective reference against the claims of the present application, Fukui is also insufficient to support a case of anticipation under 35 U.S.C. 102 for the reasons discussed below.

In the present invention, the mechanical properties of the current collector and binder are critical to obtaining improved charge-discharge cycle characteristics. Moreover, in the present invention, the binder is caused to be thermally bonded to the current collector to improve adhesion between the binder and the current collector by heating to a temperature higher than a glass transition temperature of the binder. The criticalness of the mechanical properties of the current collector and binder and of the heat treatment is demonstrated by the data of the examples in the specification of the present application.

Neither Nobufumi nor Fukui discloses or suggests the criticalness of the mechanical properties of the current collector

and binder of the negative electrodes disclosed therein and neither discloses or suggests a heat treatment as in the present invention. The Office has not shown why such properties would necessarily be inherent in Nobufumi and Fukui. Inherency of a reference that is required to support a rejection for anticipation under 35 U.S.C. § 102 cannot be a mere possibility.

Regarding other allegations in the Action, the Office takes the position that limitations such as those recited in claim 5 are a matter of optimization. However, optimization must come from within the teachings of the prior art. Neither Nobufumi nor Fukui discloses anything regarding the criticalness of the relationship $5Y \geq X$ and $250Ra > X$, which, if satisfied, prevents the active material layer from flaking off from the current collector. Also, as noted above, neither suggests the criticalness of the mechanical properties of the current collector and binder as recited in the present claims. Therefore, contrary to the allegation in the Action, there is nothing in Nobufumi or Fukui to suggest that any of the recited properties of the current collector and binder are "result-effective" variables.

The Office states that the glass transition temperature of PVDF is "30°C". However, the glass transition temperature of PVDF is about -38°C. Attached hereto is a printout from

www.polymerprocessing.com showing the glass transition temperature of PVDF.

The Office also states that Nobufumi discloses that the binder is a thermoplastic polyimide. However, Nobufumi does not disclose a thermoplastic polyimide as a binder. Nobufumi discloses in paragraph [0031] various types of binders for use in the invention disclosed therein. A thermoplastic polyimide is not included.

For the above reasons, Nobufumi and Fukui are insufficient to support a rejection of the claims under 35 U.S.C. § 102 or an alternative rejection under 35 U.S.C. § 103(a) and removal of the rejections is in order.

The foregoing is believed to be a complete and proper response to the Office Action dated April 11, 2006, and is believed to place this application in condition for allowance. If, however, minor issues remain that can be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number indicated below.

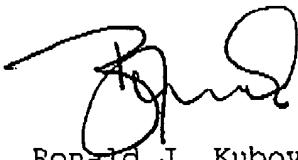
In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 111833.

PATENT APPLN. NO. 10/519,073
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

In the event any additional fees are required, please also
charge our Deposit Account No. 111833.

Respectfully submitted,
KUBOVCIK & KUBOVCIK



Ronald J. Kubovcik
Reg. No. 25,401

Atty. Case No. MAM-056
The Farragut Building
Suite 710
900 17th Street, N.W.
Washington, D.C. 20006
Tel: (202) 887-9023
Fax: (202) 887-9093
RJK/jbf

poly(vinylidene fluoride)

PolymerProcessing
.com

HOME

OPERATIONS

POLYMERS

RESOURCES

NOTES

ABOUT

PolymerProcessing.com > Polymers > PVDF

poly(vinylidene fluoride)

alternative

[Alphabetical List](#)

[Class Listing](#)

[Formula Listing](#)

(PVDF)

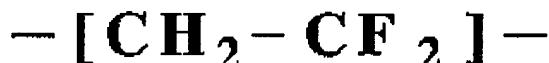
Properties

Repeat Unit

Glass transition temperature: -38°C.



Melting temperature: 160°C



Crystalline density at 25°C: 2.00 g/cm³.

Molecular weight of repeat unit: 64.03
g/mol

Typical physical properties

Description

Poly(vinylidene fluoride) (PVDF) is known particularly for its creep resistance over a broad range of temperatures. It is widely used for gasketing and the lining of pipes and tanks.

Suppliers

[Ausimont](#)

Caution: The information on this web site may be unreliable, misleading, out-of-date, or just plain wrong.
PolymerProcessing.com accepts no liability for use or misuse of the information contained herein.

Polymer processing operations often present numerous safety hazards.
You should obtain advice from an experienced professional or consultant.

[SITE MAP](#)

[THE EDITOR](#)